BY ORDER OF THE
SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 33-115

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Communications

NETWORKS MANAGEMENT

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This Air Force instruction (AFI) implements Air Force Policy Directive (AFPD) 33-1, *Command, Control, Communications, and Computer (C4) Systems*. It identifies responsibilities for supporting critical Air Force command, control, communications, and computer (C4) networks, primarily through base network control centers (BNCC). Major commands (MAJCOM), field operating agencies (FOA), and direct operating units (DRU) send one copy of their supplement to Headquarters Air Force Command, Control, Communications, and Computer Agency, Policy Branch (HQ AFC4A/XPXP). Refer recommended changes and conflicts between this and other instructions to HQ AFC4A/XPXP, 203 West Losey Street, Room 1065, Scott AFB IL 62225-5224, on AF Form 847, **Recommendation for Change of Publication**, with an information copy to Headquarters United States Air Force, Policy and Strategy Division (HQ USAF/SCXX), 1030 Air Force Pentagon, Washington DC 20330-1030. Refer technical questions on the content of this instruction to HQ AFC4A, Network Support Branch (HQ AFC4A/SYNN), 203 West Losey Street, Room 3065, Scott AFB IL 62225-5234. See Attachment 1 for a glossary of references, abbreviations, and acronyms.

SUMMARY OF REVISIONS

This revision updates the entire document.

1. Introduction. Network management (NM) is crucial to providing effective, efficient, and reliable C4 information network services used in critical Department of Defense (DoD) and Air Force wartime, business, and C4 processes. The BNCC is the single focal point on each base to provide NM and customer support for these critical services. This instruction provides the guidance necessary to manage the increasingly complex network environment and provide users high quality C4 services. See Attachment 2 for classes of network elements.

2. Background. Wings must organize C4 communications resources to match the Air Force's force management and deployment concepts. The communications force structure is reducing in parallel with the combat force structure. Concurrently, the command and control (C2), intelligence, and combat support communities are implementing local area networks (LAN) to meet an increasing need for horizontal coordination versus the traditional vertical C2 processes. Most of these systems are independently installed and operated, creating fragmented lines of communications. A BNCC, in all Air Force wing communications units, allows establishment of a consolidated NM facility for base networks to rapidly respond to a full range of peacetime and wartime operational contingencies. The BNCC uses existing wing resources.

3. Hierarchy of Network Management.

3.1. Air Force NM. Air Force NM consists of three areas of distributed responsibility, region and community of interest, BNCC, and functional area system administration.

Table 1. Base-Level Hierarchy of Network Management.

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OPR: HQ AFC4A/SYNN (CMSgt Lawrence Galvin)
Certified by: HQ USAF/SCXX (Lt Col George L. Fiedler)
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Base-Level Network Management Area of Responsibility	Responsible Support Activities Examples Facility Control Office (FCO)/Network Control Office Global Control Center (GCC)/Regional Control Center (RCC)/Defense Satellite Communications System Operations Center (DSCSOC)
Region	
Community of Interest	Air Force Personnel Center (AFPC)
Base Network Control Center (BNCC)	Base-wide C4 Network
Functional Area System Administration	Building or Complex
Functional Area System Administration	Organization
Functional Area System Administration	Functional/Work Group Manager*

*Work group managers provide support at the directorate, workcenter, or shop level.

3.1.1. Region or Community of Interest C4 Services.

3.1.1.1. Region. This function centrally manages distributed network capability, such as satellite ground stations, smart multiplexers, Air Force Defense Data Network (DDN) concentrators, centralized processing, and so forth. Transferring responsibility to Defense Information Systems Agency (DISA) has eliminated most of these facilities in the Air Force. For example, the master control center of the Air Force Satellite Communications System is classed as a regional center. The BNCC provides support to base customers for regional and community of interest C4 services.

3.1.1.2. Community of Interest. This function is very similar to a regional management capability, but usually supports only a selected set of Air Force centralized information processing customers in a functional community. Examples of community of interest NM centers are the AFPC, Global Weather Central, and so forth.

3.1.2. BNCC. The BNCC manages base level C4 processing capabilities that provide the warfighter and business users the information resources needed to achieve their operational objectives. As the single focal point for base NM and problem resolution, it uses collocated independent NM systems, remote support tool sets, and consolidated C4 personnel to rapidly respond to a full range of peacetime and wartime operational contingencies. It is the base-level central point of contact for mission C2 and business systems that are part of the base network. It uses remote support tool sets to reduce wing communications unit dispatch for on-site customer support for those systems included in the base network. The BNCC provides fly-away C2 systems and network support for deployed wings and also simultaneously manages C4 systems maintenance for all base users. The BNCC is responsible for maintaining network operations. The BNCC focuses on providing responsive C4 support to the operational commanders it services.

3.1.3. Functional Area Systems Administration. This is an adjunct area to the BNCC for those locations where performance warrants having resident systems and, or network support capability in a building, complex, or organization work group to meet customer support response times. Building, complex, and organizational NM areas of responsibility are progressively subordinate levels of NM to the BNCC. Functional area systems administration is normally performed by a trained functional community specialist.

3.1.3.1. Building or Complex. This system administration area focuses on providing customers in a specific building or complex of buildings, systems and network administration, and security support for internal building or complex C4 services.

3.1.3.2. Work Group. This function will continue to fulfill the need for functional community system administration support; particularly for unique organizational software configurations, C4 inventory accountability, information access and security, timely user training, and organizational problem resolution coordination.

3.2. The NM areas work together to provide support for all networked C4 systems. The BNCC will establish a classified cell if a base requires it to process classified information.

3.3. BNCC Support. The BNCC supports the wing and base mission by providing three major areas performing NM functions:

3.3.1. Help Desk Operation. The help desk is the base?s ?first line? of problem resolution and is the user’s primary point of contact for C4 problems. The help desk will determine the type of reported C4 systems problems within defined response times; report the status of problem resolution to the affected customer; and maintain a historical database associated with problem resolution.

It also provides a central repository for technical advice and solutions for network systems, software applications assistance, automatic data processing accountability support, hardware exchange, and repair service support. Route problems the help desk cannot handle to other BNCC functional areas, to the Defense Megacenters (DMC) or, if necessary, to other technical support agencies such as DISA and the Standard Systems Group at Gunter AFB AL.

3.3.2. NM. Provides proactive and reactive management of C4 resources by monitoring and controlling the network, available bandwidth, and distributed software resources. NM will respond to detected network faults (errors) and user reported outages at the time of help desk referral. If NM personnel cannot resolve a customer complaint or

query, the help desk will refer the problem to a C4 system specialist in the specific area of support (SAS) function.

3.3.3. SAS. Provides a ?second line? of problem resolution. SAS is the set of specialists for resolving those classes of problems associated with the various elements of the base infrastructure that help desk personnel are not trained or equipped to address. SAS will determine if the help desk has correctly classified and assigned the problem, dispatch on-site maintenance, and report results back to the help desk. SAS personnel may or may not be physically assigned to the BNCC; however, they are functionally accessible resources both in peacetime and wartime, in-garrison and deployed.

3.3.4. The BNCC performs the following functions: configuration management, fault isolation, minor engineering, information protection operations, performance management, accounting management, network planning, training, and customer support of all networked base C4 resources. The BNCC will delegate functions to a lower level area of responsibility only if necessary to meet customer service.

3.4. Base-Level NM Hierarchy Activities:

3.4.1. BNCC NM. This function consists of managing the base network or metropolitan area network, including performance of physical NM. In simple terms, this entails technical management of LANs interconnected on a base and managing the base routers and internet protocol (IP) addresses. NM includes the sum total of all tasks done to perform configuration, fault, security, and accounting management for all information technology services to base functional area system administrators and end-users. NM addresses the interconnection of independently administered computer systems to deliver global network services to end-users. A subcategory of NM is ?network administration? consisting of managing the various functional area LANs from the network hardware and software operating systems level. Network administrative tasks include: file server management which includes operating systems; application software interfacing; metering and virus scanning software; server backup; contingency planning and disaster recovery for responsible LANs; and providing technical assistance to functional system administrators and work group managers who provide administration support from their servers to their end-user workstations. There is significant overlap between these tasks and traditional system administration tasks. As technology insertion to base infrastructure and system administrative tasks occur and resources are acquired, BNCCs will increase their technical ability to reduce overlapping responsibilities and centrally support network administrative tasks. See Attachment 4 for tasks performed.

3.4.2. Functional Systems Administration. A functional systems administrator provides a support level function between network managers and work group managers for a functional system that includes servers, peripheral LAN devices, and related software applications support. The function is normally performed by a person assigned to a supported unit or function who is familiar with the functions performed within that functional area or workcenter. Duties include the day-to-day administration of data, client and server, or related system segments with prime responsibility for functional applications and data as well as local software applications. Responsibility for providing assistance beyond the capability of the functional systems administrator at the protocol or operating systems level rests with the network manager or network administrator. See Attachment 4 for tasks performed.

3.4.3. Work Group Manager. This critical function is responsible for the initial user support within the assigned work group. This duty is performed by a person assigned to a supported unit who is familiar with the functions and people within the work group. They are responsible for all support activities pertaining to single client workstations and the associated software applications and data. They provide initial contact line support within their workcenter to immediate end-users and critical indirect support to the functional system administrator by freeing time for higher level support requirements. The work group managers receive support from their functional system administrator or, when beyond local capabilities, the BNCC. See Attachment 4 for tasks performed.

3.5. DMC C4 Services. The BNCC provides support to local customers for DMC C4 services at a level commensurate with mission requirements. The military departments? operations and maintenance organizations must fund and meet certain level-of-service standards set by DISA. The BNCC monitors and reacts to base-level service degradation alarms and trouble calls, works with the DMC NM counterparts to isolate problems, restores service, and works with local operations and maintenance organizations or contractors to resolve problems within the base C4 infrastructure. When customers encounter a problem, they will contact their automated information system (AIS) functional office of primary responsibility (OPR). If the AIS functional OPR cannot resolve the problem, follow the procedure in 3.5.1.

3.5.1. Work AIS application specific actions (?application level? as defined below) directly between specific base AIS functional OPRs and the DMC. Work all other actions (?interface level? and below) through the BNCC. If the problem cannot be resolved at the BNCC, the BNCC will forward the problem to the DMC/regional processing center (PRC), or other specific support agency.

Table 2. DMC C4 Services Problem Resolution Matrix

INTERFACE LEVEL AIS Customer to BNCC	**APPLICATION LEVEL** AIS Customer to DMC AIS Monitor

Print problems	Start jobs
Communications and DDN problems	Up & down AIS
Security	Job aborts
NAPZOO	Star
Hardware	Control cards
Undefined problems	Scheduling jobs
	Scheduling additional on-line time
	Scheduling special processing
	Release loads
	Loads
	EZ loads

NOTE: While the standard base-level computer functional OPR may call the DMC/system management center directly for problems and actions identified as normal day-to-day application, specific actions, any notification of AIS problems, outages, and so forth, will be made directly to the BNCC, not to the base AIS functional OPR.

3.5.2. The BNCC is also responsible for the following functions in support of regional processing:

3.5.2.1. Operate and coordinate maintenance on distributed communication processors and front end processors; manage communication links between the local FRC and devices located on base and supported sites.

3.5.2.2. Coordinate and provide media conversion (for example, upload and download disk and tape files [air gaps] for AIS users without connectivity to the DMC or Air Force Regional Processing Center [AFRPC]).

3.5.2.3. Provide print management (that is, print and distribute listing for AIS users without distributive print workstations) and distributed print training.

3.5.2.4. Monitor difficulty reports, heads-up messages, and system advisory notices.

3.5.2.5. Maintain AIS manuals required for use by the BNCC (for example, security, print, and so forth).

3.5.2.6. Receive standard and base-level software release documents (documentation only) from Standard Systems Group/SSQ, and distribute documentation (for example, manuals, AF Form 636, **Systems Change Release Document**, and so forth) to the respective base functional OPRs as needed until the distribution process is fully automated.

3.5.2.7. Maintain DMC or AFRPC platform status (hardware and software) for customers.

3.5.2.8. Ensure compliance with established security procedures, and report security incidents and identified system vulnerabilities to the wing information protection office.

3.5.2.9. Maintain configuration management by coordinating and assisting with relocation of terminals and other configuration changes.

3.5.2.10. Coordinate configuration changes affecting the regional platform with the appropriate DMC or AFRPC before implementation.

3.6. Information Protection. The BNCC provides for the availability, integrity, and confidentiality of the base network infrastructure and BNCC-managed assets. Base network users will report security incidents and vulnerabilities to the help desk for resolution.

4. Service Level Agreements and Guidance Distribution.

4.1. SLAs define division of responsibilities for network operations and services between BNCC and customer functional areas. SLAs define network service availability rates, fault response times, BNCC dispatch responsibilities, configuration change procedures, initial fly-away C4 support requirements, fee-for-service charges (where applicable), customer escalation procedures, security management procedures, and other BNCC-provided services. They also define resources both parties will provide to support delivery of negotiated services. C4 systems officers (CSO) negotiate the SLA for each NM location. When necessary, they formalize agreements through memoranda of understanding or agreement, interservice support agreements, or supplements to this instruction.

See Attachment 3.

4.2. CSOs distribute procedural changes via general messages, electronic mail or address indicator group messages. They use electronic bulletin boards, if possible, to distribute handbooks created by the BNCC.

5. Network Management Information Sharing. DISA NM span of control will stop at base level demarcation points. DISA will have visibility into the base network through read-only capability and the base will have a similar capability into the Defense Information System Network (DISN) and information processing activities. All DoD organizations must share network information and analysis data among themselves and DISA NM centers. Electronic exchange of information allows operations and maintenance management and higher level NM functions to retrieve and query analysis reports and raw data (through a bulletin board file server).

6. Responsibilities.

6.1. HQ AFC4A/SYNN:

6.1.1. Establishes and maintains an electronic repository developed by each level of the Air Force NM hierarchy. This repository includes:

6.1.1.1. C4 management standards.

6.1.1.2. Current policy and procedures.

6.1.1.3. Process flow charts.

6.1.1.4. Lessons learned.
6.1.1.5. Training sources.
6.1.1.6. Training modules.
6.1.2. Establishes and chairs an Air Force Internet Review Board (AFIRB) to standardize naming conventions, database codes and elements, and network configurations. The AFIRB includes technical representatives from the MAJCOMs and other organizations as required.
6.2. MAJCOM CSOs:
6.2.1. Equip each NM site with the resources it needs to meet:
6.2.1.1. Service provisioning response times.
6.2.1.2. Service availability standards.
6.2.1.3. Service degradation or failure restoration times.
6.2.1.4. User or subscriber education and training needs.
6.2.1.5. Deployment or contingency support requirements.
6.2.1.6. Network security monitoring.
6.2.1.7. On-line surveys.
6.2.1.8. Security incident reporting and response.
6.2.1.9. Network mapping.
6.2.2. Provide requested unit procedures, checklists, handouts, and training materials to HQ AFC4A/SYN for distribution to other Air Force and DoD organizations.
6.3. Base CSOs:
6.3.1. Identify NM requirements for each NM area for which the base wing is tasked to operations and maintenance or establish for supporting specific communities of interest management. Work with the base systems telecommunications engineering manager (STEM-B) to define and add technical solutions to the base blueprint for funding prioritization and future implementation.
6.3.2. Renegotiate or amend current base contracts to support centralized NM, using Air Force 33-series publications and negotiated support agreements to guide definition of contract requirements.
6.3.3. Allocate to each NM area enough resources to meet service provisioning response times, service availability standards, service degradation or failure restoral times, user or subscriber education and training needs, network security monitoring, on-line surveys, security incident reporting and response, network mapping, and deployment or contingency support requirements.
6.3.4. Establish or consolidate a NM area subordinate to the BNCC according to user or subscriber negotiated service level of agreements, system or network performance specifications, and minimum Air Force NM quality of service standards.
6.3.5. Establish briefing and reporting requirements (frequency and format) for C4 infrastructure status, performance, and quality of service to aid base-level decision-making regarding infrastructure changes, procedures, training, and other issues.
6.3.6. Support host and tenant organization missions.
6.3.7. Evaluate the services provided by each area NM location according to system or network performance standards. Direct changes in procedure, allocation of resources, or training methods to minimize resource requirements and improve quality of service.
6.3.8. Target stand-alone and redundant NM capabilities and responsibilities for consolidation to minimize the amount of resources used to do NM while optimizing C4 performance and quality of service.
6.3.9. Appoint an office (such as system controller, BNCC, technical control facility [TCF], planning and implementation flight) to convene working groups to develop base policy and procedures for migrating NM toward the Air Force architectures and standards.
6.4. BNCC:
6.4.1. Acts as DDN concentrator and DDN node site coordinator as defined in Defense Information Systems Agency Circular (DISAC) P70-series and Air Force 33-series publications.
6.4.2. Coordinates installation, acceptance testing, quality assurance, fault isolation, and restoration of the C4 infrastructure with the base's other communications unit functions.
6.4.3. Dispatches BNCC or systems flight technicians to unmanned or user and subscriber locations when required to test, troubleshoot, and restore service.
6.4.4. Establishes individual circuit and system parameters on non-Defense Communications System (DCS) circuits. Develops the parameters according to DISAC 300-175-9, *DCS Operating-Maintenance Electrical Performance Standards*, August 29, 1986, supplemented by commercial-leased equipment and circuit performance standards.
6.4.5. Establishes initial performance thresholds according to systems and circuit operation specifications and operational or mission requirements.
6.4.6. Controls all C4 service points on a base. The BNCC will make sure all service points have functional layout diagrams, hardware interconnection listings, test point location listings, and expected signal characteristics at each test point. It also sees that the service points have hardware labels that clearly identify individual circuit connections and test points. If the service point is too small to contain the above information, then the BNCC will maintain copies for dispatch technicians to use. Any changes in the service point configuration or in service operation must be noted in the service point information.
6.4.7. Works with STEMs and participates in the review and planning of base transmission media and telecommunications systems networks. Makes sure replacements for legacy or dumb network devices incorporate remote support capability to improve centralized NM performance and quality.
6.4.8. Integrates, configures, tests, monitors, analyzes, controls, and restores systems to maintain top performance of intrabase C4 and local support for DMC/RPC C4 services.
6.4.9. Remotely provides equivalent service for unmanned sites or facilities, when required.

6.4.10. Performs the following centralized functions for subordinate NM areas when feasible:
6.4.10.1. Allocation and minor engineering.
6.4.10.2. Installation.
6.4.10.3. Quality control and quality assurance.
6.4.10.4. NM operations and security.
6.4.10.5. Education and training.
6.4.11. Consolidates network performance data, security data, and analysis reports from all levels of the Air Force NM hierarchy. Uses the consolidated information to identify causes of C4 service and performance, and security flaws. On the basis of the aggregated analysis, recommends changes in network configurations, hardware or software, procedures, and staff training.
6.4.12. Remotely performs the functions and duties of a DCS TCF, patch and test facility, DCS switching center, or other DCS operations function, when it is technically and economically feasible and does not degrade quality of service in accordance with DISA procedures. To support the wing during contingencies, the BNCC takes over the responsibility and authority of the TCF for DCS service control.
6.4.13. Remotely configures user and subscriber terminals, computer hardware and software resources, intrabase and long-haul (tail) circuits, systems, and networks. Base reconfiguration on subscriber service requirements, network traffic patterns and loading, and results of quality assurance tests.
6.4.14. Remotely tests subscriber equipment, end-to-end circuits, systems, and networks to verify the services provided and input and output signals meet standards.
6.4.15. Coordinates with subscribers, local and distant support agencies, and contractors to isolate faults, restore service, and make repairs.
6.4.16. Educates functional systems administrators, work group managers, and other base customers in network services, fault isolation, security, and trouble-reporting procedures.
6.4.17. Visits user organizations regularly to stay familiar with user requirements.
6.4.18. Adjusts remote network element equipment to optimize service.
6.4.19. Maintains selected equipment identified through SLA or logistics support letters.
6.4.20. Reconfigures equipment or mode of operation by replacing, restrapping, or reprogramming circuit boards, modules, subassemblies, and assemblies.
6.4.21. Records configuration data, test data, failure symptoms, coordination efforts, fault isolation steps performed, and any other useful information. Uses this information to evaluate and control operations, service capabilities, and service quality.
6.4.22. Reports to management on quality of C4 infrastructure services.
6.4.23. Provides deployed system and, or NM services as tasked by the wing commander.
6.4.24. Supports small and minicomputer hardware and software prescribed for the small computer systems element in AFI 33-112, *Automatic Data Processing Equipment (ADPE) Management*.
6.4.25. Performs as contractor quality assurance evaluator for BNCC-monitored C4 service contracts.
6.4.26. Serves as local support for customers and systems of the Defense Message System (DMS), DISN, RPCs, and community of interest areas in accordance with DISACs, negotiated support agreements, and the Air Force-33-series publications.
6.4.27. Establishes a help desk function as the base's single point of contact for C4 problems.
6.4.28. Provides residual support for base standard base level computer customers.
6.4.29. Maintains, manages, controls, and distributes the IP address space allocated to the base internet.
6.4.30. Establishes, maintains, controls and enforces the base internet routing policy.
6.4.31. Develops a security policy for the base network infrastructure. Ensures accreditation of all systems and networks before attaching them to the base network.
6.4.32. Conducts information protection operations.
6.5. Functional Area Systems Administrator (building, complex, and organizational NM areas [if established to meet customer service levels]):
6.5.1. Performs the functions defined for all NM areas. They also assume responsibilities delegated by the BNCC or CSO to optimize C4 infrastructure performance and quality of service. Consider consolidating duties such as systems administration and LAN management within an organization or a building and, if possible, merging them with the BNCC-based on a SLA.
6.6. Work Group Managers and Networked C4 Service Users:
6.6.1. Comply with the policies of this instruction.
6.6.2. Comply with functional systems administrator and BNCC-negotiated SLAs.
6.7. All NM Areas:
6.7.1. Use Air Force 33-series publications and applicable DoD, DISA, and Air Force publications to govern and guide network operations.
6.7.2. Participate in the Quality Air Force process, requirements technical solution evaluation process, interfunctional support negotiations, procedural definition process, and work groups.
6.7.3. Identify and defend, through the base CSO, resource and training requirements to optimize domain service delivery and capability, including support for deployment and contingency operations. Reallocate resources to higher levels, when possible.
6.7.4. Reallocate resources to other NM areas when it will not harm quality of service.
6.7.5. Establish performance and quality of service standards for each class of connection and service. Use DoD and

Air Force standards, unless more stringent standards are negotiated.

6.7.6. Sponsor education and training seminars for users, subscribers, and C4 infrastructure technicians. Supplement material given in other training programs. Orient education toward improving the C4 infrastructure quality of service and security.

6.7.7. Train personnel to:

6.7.7.1. Allocate and configure services and resources.

6.7.7.2. Control quality of NM operations.

6.7.7.3. Administer security.

6.7.7.4. Administer data bases.

6.7.7.5. Certify training and positions.

6.7.7.6. Install system.

6.7.7.7. Manage and respond to trouble calls.

6.7.7.8. Perform NM system operations (for example, configuration, fault, performance, security, and accounting management).

6.7.7.9. Educate and train customers.

6.7.8. Establish a position certification program for each position within the organization. Positional certification enhances user and subscriber service by making sure C4 personnel are adequately trained.

6.7.9. Gather and analyze performance data on services provided by the infrastructure domain or domains within the NM area's span of control. Enter data and analysis results onto an electronic bulletin board so that all levels of the Air Force NM hierarchy can use it. Recommend corrections for service problems (for example, configuration or procedure changes, additional training, equipment upgrades, additional test devices).

6.7.10. Send MAJCOMs a copy of internally developed or modified procedures, agreements, process flow lists, checklists, informational handouts, and training materials for review, consolidation, and reissue by other USAF and DoD organizations.

6.7.11. Develop, coordinate, and maintain support plans for contingency, service restoration, unit type code requirements, and deployed capability. Validate and test plans regularly.

6.7.12. Manage resources within a NM area's domain through automated processes for such things as permissions, scheduling, database administration, memory back-ups, and memory and file allocation.

6.7.13. Implement, operate, and maintain appropriate security measures.

6.7.14. Maintain, or have access to, a library of DoD, USAF, and MAJCOM C4 publications, commercial manuals, training material, and technical orders for operations and maintenance of domain resources.

6.7.15. Keep an inventory of base and long-haul telecommunications equipment. Use existing and embedded automated domain network databases. Database information must comply with DoD database codes and elements guidance to allow exporting of data for higher level review, validation, and reporting. See DoD Directive 4640.13, *Management of Base and Long-Haul Telecommunications Equipment and Services*, December 5, 1991.

7. Training.

7.1. Constant change in C4 systems hardware and software capabilities, and high levels of service quality expected by C4 users, require an in-depth training and certification program.

7.2. Work with Air Education and Training Command (AETC) to create and modify training modules, learning guides as you install or modify systems and services, and when you receive initial contractor training. The training modules and learning guides should conform to instructional systems development standards. They should qualify entry level personnel to perform tasks as journeymen and supervisors and should support follow-on qualification training and certification.

7.2.1. Do not modify nor eliminate training modules and learning guides just because all assigned personnel are currently qualified.

7.2.2. Use AFI 36-2201, *Developing, Managing, and Conducting Training*, to guide training program development, implementation, and maintenance.

7.3. Reduce the need for local training modules or learning guides by using Air Force on-the-job training products (see Air Force Index 8, *Numerical Index of Specialized Education/Training Publications*). If existing Air Force job qualification standards or qualification training packages are not adequate, supplement them with local guides.

7.4. BNCC personnel must receive both general and technical information protection training. General training provides knowledge of standard network threat and vulnerabilities, and standard security principles. Technical training qualifies individuals to implement specific information protection measures on the combination of operating systems, and security applications in use at a base. Obtain training either from the AETC formal courses, Air Force Information Warfare Center, or through available distance learning training or on-the-job training products.

7.5. Use all possible avenues of training delivery to achieve and maintain quality of service. AETC resident and field training detachment courses may not provide all the training needed at every location in the Air Force. Fill the gaps with commercial training and unit-sponsored seminars and courses. People who attend commercial training courses should develop training modules and learning guides. Keep all commercial course materials and use them to deliver follow-on training.

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DCS/Command, Control, Communications, and Computers

GLOSSARY OF REFERENCES, ABBREVIATIONS, AND ACRONYMS

References

AFPD 33-1, *Command, Control, Communications, and Computer (C4) Systems*
AFPD 33-2, *C4 Systems Security*
AFI 33-112, *Automatic Data Processing Equipment (ADPE) Management*
AFI 36-2201, *Developing, Managing, and Conducting Training*
AFIND 8, *Numerical Index of Specialized Education/Training Publications*
Base Network Control Center (BNCC) Concept of Operations (CONOPS)
BNCC CONOPS, Annex A, *Information Protection*
DISAC 300-175-9, *DCS Operating-Maintenance Electrical Performance Standard*
DoDD 4640.13, *Management of Base and Long-Haul Telecommunications Equipment and Services*

Abbreviations and Acronyms

AETC−Air Education and Training Command
AFI−Air Force Instruction
AFIRB−Air Force Internet Review Board
AFPC−Air Force Personnel Center
AFPD−Air Force Policy Directive
AFRPC−Air Force Regional Processing Center
AIS−Automated Information System
BNCC−Base Network Control Center
C2−Command and Control
C4−Command, Control, Communications, and Computer
CSO−C4 Systems Officer
DCS−Defense Communications System
DDN−Defense Data Network
DISA−Defense Information Systems Agency
DISAC−Defense Information Systems Agency Circular
DISN−Defense Information Systems Network
DMC−Defense Megacenters
DMS−Defense Message System
DoD−Department of Defense
DSCSOC−Defense Satellite Communications System Operations Center
FCO−Facility Control Office
GCC−Global Control Center
IP−Internet Protocol
LAN−Local Area Network
MAJCOM−Major Command
NM−Network Management
OPR−Office of Primary Responsibility
RCC−Regional Control Center
RPC−Regional Processing Center
SAS−Specific Area of Support
SLA−Service Level Agreement
STEM−Systems Telecommunications Engineering Manager
TCF−Technical Control Facility

CLASSES OF NETWORK ELEMENTS

A2.1. Networks formed by element classes support the conversion, storage, processing, and transfer of audio, video, text, and graphics information. The information is shared within and between work groups, organizations, buildings, and bases.

A2.2. General classes of network elements making up the base-level C4 infrastructure that are managed by the Air Force NM hierarchy are:
A2.2.1. Human/machine interface.
A2.2.2. Telephone.
A2.2.3. Facsimile.
A2.2.4. Video.
A2.2.5. Application programs.
A2.2.6. Computer operating systems.
A2.2.7. Network operating systems.
A2.2.8. Communications protocols.
A2.2.9. Computer/workstation systems.
A2.2.9.1. Personal.
A2.2.9.2. Multiuser.
A2.2.9.3. Mini.
A2.2.9.4. Mainframe.
A2.2.9.5. Front-end processor.
A2.2.10. Specialized input/output devices.
A2.2.10.1. Printers.
A2.2.10.2. Plotters.
A2.2.10.3. Scanners.
A2.2.10.4. Computer-controlled presentation systems.
A2.2.10.5. Session encryption devices.
A2.2.10.6. Access control devices.
A2.2.10.7. Back-up devices.
A2.2.10.8. Mass storage.
A2.2.10.9. Pointer and drawing devices.
A2.2.10.10. Tactile sensors.
A2.2.10.11. Voice control devices.
A2.2.11. Access switches.
A2.2.12. Matrix switches.
A2.2.13. Packet switches (packet assemblers/dissemblers).
A2.2.14. Stored program circuit switches.
A2.2.15. Concentrators.
A2.2.16. LAN/wide area network.
A2.2.16.1. LAN server processors (including disk, file, applications, and C4 servers).
A2.2.16.2. Network interface cards.
A2.2.16.3. Protocol converters.
A2.2.16.4. Hubs.
A2.2.16.5. Transceivers.
A2.2.16.6. Media access units.
A2.2.16.7. Bridges.
A2.2.16.8. Routers.
A2.2.16.9. Gateways.
A2.2.16.10. Link encryption devices.
A2.2.17. Smart multiplexers.
A2.2.18. Modem/line drivers.
A2.2.19. Digital access and cross-connect systems.
A2.2.20. Multiplexer.
A2.2.21. Media (media drivers).

SAMPLE SERVICE LEVEL AGREEMENT CONTENT AREAS

The following is a sample of a SLA format between the service provider (NM location) and the customer. The sample agreement only shows minimum topics that should be addressed:

1. Introduction.

a. Parties (organizations) involved:

(1) Service provider: (that is, BNCC).

(a) POC names.

(b) Location or office symbol.

(c) Telephone numbers.

b. End-user organization.

(1) POC names.

(2) Location or office symbols.

(3) Telephone numbers.

2. Purpose. The purpose of this SLA is to state the relationship between the service provider and the end-user organization. It specifies the services and commitments of the BNCC as well as the expectations and obligations of the end-user organization.

3. Responsibilities of Service Provider (Name of the Organization).

a. The service provider agrees that it will:

(1) Specify what resources will be used.

(2) Describe how the customer will be informed of C4 infrastructure changes and new or changed service.

(3) State security methods that will be used to protect C4 infrastructure resources from unauthorized access, monitoring, or tampering.

(4) Describe process used to notify and coordinate with end-user organization about planned outages of connectivity, equipment, or electricity.

(5) Explain the coordination process for service degradation or failure correction and state how customer will be kept informed of status.

(6) Describe materials that will be provided to customer to minimize procedural errors.

(7) Explain customer support performance criteria and workload limitations (for example, hours of operation, response times, expected maximum calls).

(8) Describe what performance data and analysis reports will be provided to the customer organization to show service quality and level of customer support provided.

(9) State what customer training is available and what service provider's role will be in customer training.

(10) Perform periodic surveys to monitor customer satisfaction.

4. Responsibilities of End-User Organization.

a. The end-user organization agrees that it will:

(1) Describe the process used to ensure end-users know procedures for getting help.

(2) Coordinate with service provider on any major configuration changes (for example, network installation/expansion, change in topology, system upgrades, relocation, and so forth).

(3) Describe the process used to notify end-users of planned outages of connectivity, equipment, or electricity.

(4) Work group managers and system administrators will provide, upon request, equipment layout, network schematic, network connectivity (attached via backbone or stand alone), and their exact location.

(5) Describe how they will use the performance and trend analysis data from service provider and provide feedback to improve service.

(6) Develop end-user contingency operations plans and capabilities.

(7) Identify what resources will be matrixed or transferred to service provider.

(8) Provide service provider with access to equipment both electronically and physically as needed.

b. During a trouble call, the end users will:

(1) Contact end-user organization POC first, if available.

(2) Describe what minimum information will be provided (for example, name, organization, location, telephone number, equipment number, user-id, e-mail address, and so forth).

(3) Provide service provider with a description of problem, it's priority, and potential mission impact.

(4) Work with the service provider during fault isolation process, as needed.

(5) Describe how increased workload/expansion will be negotiated for contingencies or new support.

5. Customer Escalation Procedures. The two parties agree to the following procedures in case the problem needs to be escalated (that is, when the customer is not satisfied with the service provided):

ESCALATION LEVELS	**TO WHOM**	**PHONE NUMBER**
1st		
2nd		

3rd

6. Conclusion.

a. Parties agree that the terms of this agreement will be in effect for (*5 years, 6 months, and so forth*) to be reviewed *(annually, semiannually, and so forth*).

b. The parties agree to the following mechanism for initiating an out-of-cycle SLA review:

Service levels and procedures established herein have been agreed to by parties represented by undersigned.

_____ _____

(*Service Provider Representative Signature*) (*End-User organization Signature*)

Attachments (*add as needed*):

1. Hours of Operation.

2. Definitions of Terminology.

3. Lists of Support Equipment and Software.

4. Summaries of Applicable Contracts.

5. Contingency Plan.

SYSTEMS AND NETWORK SUPPORT

This table identifies the breakdown of network elements, tasks performed, and assigns responsibility.

Table A4.1. Systems and Network Support Task Breakdown

Classes of Network Elements	Tasks	Funct Sys Adm	Net Mgt	WG Mgr	End User	Wire Cable
Computer/Workstation						
Single Client Systems		**X**		**X**	**X**	
	Select operating area			X	X	
	Install equipment	X		X	X	
	Connect peripherals	X		X	X	
	System startup	X		X	X	
	Maintain hardware	X		X	X	
	Create, modify, delete directories	X		X	X	
	Construct file systems	X			X	
	Move files from one media to another			X	X	
	Review file contents	X		X	X	
	Secure files from erasure				X	
	Check files for corruption			X	X	
	Perform system diagnostics	X		X	X	
	Format, partition, repartition to determine available disk space	X		X		
	Format floppies				X	
	Create floppy boot disk			X	X	
	Make copies of floppies				X	
	Install, modify remove systems security	X		X	X	
	Backup and restore hard drives	X		X	X	
	Customize backup device driver	X		X	X	
	Recover from system crash	X		X		
	Physical security	X		X	X	
Multi-user Systems /Server	Receive and inventory equipment	X		X		
	Select operating area	X				
	Install equipment	X	X			
	Install cabling	X	X			X
	System startup	X				
	Maintain hardware	X	X			
	Create, modify, delete directories	X				
	Construct file systems	X				
	Move files from one media to another	X		X		
	Review file contents	X		X		
	Secure files from erasure	X				

	Check files for corruption	X			
	Perform system diagnostics	X			
	Format, partition, repartition to determine available disk space	X			
	Format floppies	X		X	
	Create floppy boot disk	X		X	
	Make copies of floppies	X			
	Install, modify remove systems security	X			
	Backup and restore hard drives	X			
	Customize backup device driver	X			
	Recover from system crash	X			
	Physical security	X			
Client Workstation Resident Application Programs					
	Install and Delete user software			X	X
	Customize user software			X	X
	Diskless server support	X		X	
	Provide trouble shooting	X		X	
	Receive or inventory software			X	X
	Install/configure software			X	X
	Modify software configuration			X	X
	Remove software			X	X
	Setup and modify user interface menus	X		X	X
	Bulk-loading and updating data base tables			X	
	Data base recovery			X	
	Customize error messages	X		X	
	E-mail/DMS address groups maintenance			X	
Specialized Devices					
	Install peripherals			X	X
	Install routers		X		
	Install bridges		X		
	Install hubs/concentrators		X		
	Media access units		X		
	CSU/DSU		X		
	Install cabling		X		
	Install workstation network interface card			X	
	Install servers	X	X		
	Install Security Devices	X	X	X	X
	File server	X	X		
	Communication server	X	X		
	Print server	X	X		

	Fax server	X	X			
	Sql server	X	X			
	Network printer	X		X		
Personal Computer Operating System/Single Client System						
	Provide troubleshooting			X	X	
	Install operating system			X	X	
	System configuration files			X	X	
	Install windows			X	X	
	Setup system password			X	X	
Network Operating Systems						
	Install NOS	X				
	Establish logical names		X			
	Assign network logical names	X				
	Load network loadable modules	X				
	Implement access control	X	X			
	Add/remove users	X	X	X		
	Modify defaults used to add users	X				
	Modify user profiles	X		X		
	Change user system addresses	X	X			
	Backup systems(servers)	X				
	Audit activity	X	X			
	Provide troubleshooting	X	X	X		
	Monitor system performance	X	X			
	Monitor and clear system logs	X				
	Advise users to remove unnecessary files	X		X		
	Customize log-in process	X				
Network Applications						
	Develop network menuing system	X				
	Load license and metering applications	X				
	Virus scanning	X				
	E-mail	X				
	Receive/inventory network applications	X				
	Install/configure, modify network application software	X				
	Directory services	X				
Network Management						
	Install NM system		X			
	Install NM software		X			
	Physical NM	X	X			X
	Mapping network devices	X	X			

	Cable management		X			X
	Utilize protocol analyzer		X			
	Utilize network monitor	X	X			
Security Management						
	Authorizing users	X	X	X		
	Examining security logs	X	X			
	Performing risk analysis	X	X	X		
Accounting Management	** *To Be Determined*					
Performance Management		X	X			
	Gathering network statistics	X	X			
	Examining network history logs	X	X			
	Evaluating systems performance under normal/ degraded conditions	X	X			
	Produce trend reports	X	X			
	Trend analysis	X	X			
	Traffic analysis (SNMP)		X			
Configuration Management		X				
	Setting parameters	X	X			
	Changing network configuration	X	X			
	Moves, adds, changes	X	X	X		
	Remote management	X	X			
	Router management		X			
	Load routing tables		X			
	Bridge management		X			
	Problem tracking	X	X	X		
	IP address management		X			
	Data switch/tac		X			
	Audit activity	X	X			
	Provide troubleshooting	X	X	X		X
Fault Management						
	Fault recognition	X	X	X	X	
	Fault diagnosis	X	X	X		
	Fault bypass recovery	X	X			
	Fault tracking and control	X	X			
	Integrate LANs to WAN	X	X			
	Communication test procedures	X	X			
	Network architecture	X	X			
	Quality assurance	X	X			
	Trouble data base maintenance	X	X			
	Future planning/technology insertion	X	X	X	X	X

Funct Sys Adm = Systems Administration, Net Mgt = Network Management, WG Mgr = Work Group Manager , Wire/Cable = Physical Management of the Cable and Wire of the network